

## MC74AC244, MC74ACT244

### Octal Buffer/Line Driver with 3-State Outputs

The MC74AC244/74ACT244 is an octal buffer and line driver designed to be employed as a memory address driver, clock driver and bus oriented transmitter/receiver which provides improved PC board density.

- 3-State Outputs Drive Bus Lines or Buffer Memory Address Registers
- Outputs Source/Sink 24 mA
- 'ACT244 Has TTL Compatible Inputs

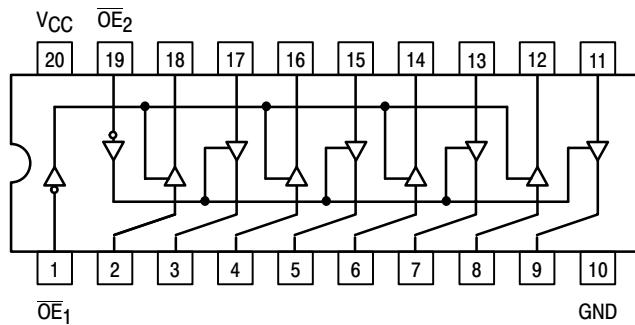


Figure 1. Pinout: 20-Lead Packages Conductors  
(Top View)

#### TRUTH TABLE

Inputs		Outputs
$\overline{OE}_1$	D	(Pins 12, 14, 16, 18)
L	L	L
L	H	H
H	X	Z

NOTE: H = HIGH Voltage Level  
L = LOW Voltage Level  
X = Immaterial  
Z = High Impedance

#### TRUTH TABLE

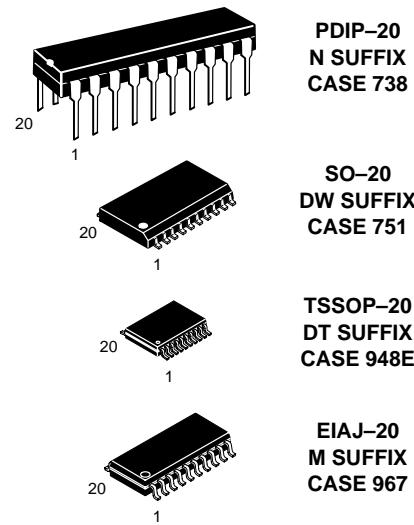
Inputs		Outputs
$\overline{OE}_2$	D	(Pins 3, 5, 7, 9)
L	L	L
L	H	H
H	X	Z

NOTE: H = HIGH Voltage Level  
L = LOW Voltage Level  
X = Immaterial  
Z = High Impedance



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#### ORDERING INFORMATION

Device	Package	Shipping
MC74AC244N	PDIP-20	18 Units/Rail
MC74ACT244N	PDIP-20	18 Units/Rail
MC74AC244DW	SOIC-20	38 Units/Rail
MC74AC244DWR2	SOIC-20	1000 Tape & Reel
MC74ACT244DW	SOIC-20	38 Units/Rail
MC74ACT244DWR2	SOIC-20	1000 Tape & Reel
MC74AC244DT	TSSOP-20	75 Units/Rail
MC74AC244DTR2	TSSOP-20	2500 Tape & Reel
MC74ACT244DT	TSSOP-20	75 Units/Rail
MC74ACT244DTR2	TSSOP-20	2500 Tape & Reel
MC74AC244M	EIAJ-20	40 Units/Rail
MC74AC244MEL	EIAJ-20	2000 Tape & Reel
MC74ACT244M	EIAJ-20	40 Units/Rail
MC74ACT244MEL	EIAJ-20	2000 Tape & Reel

#### DEVICE MARKING INFORMATION

See general marking information in the device marking section on page 186 of this data sheet.

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## MAXIMUM RATINGS\*

Symbol	Parameter	Value	Unit
V <sub>CC</sub>	DC Supply Voltage (Referenced to GND)	−0.5 to +7.0	V
V <sub>IN</sub>	DC Input Voltage (Referenced to GND)	−0.5 to V <sub>CC</sub> +0.5	V
V <sub>OUT</sub>	DC Output Voltage (Referenced to GND)	−0.5 to V <sub>CC</sub> +0.5	V
I <sub>IN</sub>	DC Input Current, per Pin	±20	mA
I <sub>OUT</sub>	DC Output Sink/Source Current, per Pin	±50	mA
I <sub>CC</sub>	DC V <sub>CC</sub> or GND Current per Output Pin	±50	mA
T <sub>stg</sub>	Storage Temperature	−65 to +150	°C

\*Maximum Ratings are those values beyond which damage to the device may occur. Functional operation should be restricted to the Recommended Operating Conditions.

## RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min	Typ	Max	Unit
V <sub>CC</sub>	Supply Voltage	'AC	2.0	5.0	6.0
		'ACT	4.5	5.0	5.5
V <sub>IN</sub> ; V <sub>OUT</sub>	DC Input Voltage, Output Voltage (Ref. to GND)	0	—	V <sub>CC</sub>	V
t <sub>r</sub> , t <sub>f</sub>	Input Rise and Fall Time (Note 1) 'AC Devices except Schmitt Inputs	V <sub>CC</sub> @ 3.0 V	—	150	—
		V <sub>CC</sub> @ 4.5 V	—	40	—
		V <sub>CC</sub> @ 5.5 V	—	25	—
t <sub>r</sub> , t <sub>f</sub>	Input Rise and Fall Time (Note 2) 'ACT Devices except Schmitt Inputs	V <sub>CC</sub> @ 4.5 V	—	10	—
		V <sub>CC</sub> @ 5.5 V	—	8.0	—
T <sub>J</sub>	Junction Temperature (PDIP)	—	—	140	°C
T <sub>A</sub>	Operating Ambient Temperature Range	−40	25	85	°C
I <sub>OH</sub>	Output Current – High	—	—	−24	mA
I <sub>OL</sub>	Output Current – Low	—	—	24	mA

1. V<sub>IN</sub> from 30% to 70% V<sub>CC</sub>; see individual Data Sheets for devices that differ from the typical input rise and fall times.
2. V<sub>IN</sub> from 0.8 V to 2.0 V; see individual Data Sheets for devices that differ from the typical input rise and fall times.

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## DC CHARACTERISTICS

Symbol	Parameter	V <sub>CC</sub> (V)	74AC		T <sub>A</sub> = -40°C to +85°C	Unit	Conditions			
			T <sub>A</sub> = +25°C							
			Typ	Guaranteed Limits						
V <sub>IH</sub>	Minimum High Level Input Voltage	3.0 4.5 5.5	1.5 2.25 2.75	2.1 3.15 3.85	2.1 3.15 3.85	V	V <sub>OUT</sub> = 0.1 V or V <sub>CC</sub> - 0.1 V			
V <sub>IL</sub>	Maximum Low Level Input Voltage	3.0 4.5 5.5	1.5 2.25 2.75	0.9 1.35 1.65	0.9 1.35 1.65	V	V <sub>OUT</sub> = 0.1 V or V <sub>CC</sub> - 0.1 V			
V <sub>OH</sub>	Minimum High Level Output Voltage	3.0 4.5 5.5	2.99 4.49 5.49	2.9 4.4 5.4	2.9 4.4 5.4	V	I <sub>OUT</sub> = -50 μA			
		3.0 4.5 5.5	— — —	2.56 3.86 4.86	2.46 3.76 4.76	V	*V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> I <sub>OH</sub> -12 mA -24 mA -24 mA			
V <sub>OL</sub>	Maximum Low Level Output Voltage	3.0 4.5 5.5	0.002 0.001 0.001	0.1 0.1 0.1	0.1 0.1 0.1	V	I <sub>OUT</sub> = 50 μA			
		3.0 4.5 5.5	— — —	0.36 0.36 0.36	0.44 0.44 0.44	V	*V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> I <sub>OL</sub> 12 mA 24 mA 24 mA			
I <sub>IN</sub>	Maximum Input Leakage Current	5.5	—	±0.1	±1.0	μA	V <sub>I</sub> = V <sub>CC</sub> , GND			
I <sub>OZ</sub>	Maximum 3-State Current	5.5	—	±0.5	±5.0	μA	V <sub>I</sub> (OE) = V <sub>IL</sub> , V <sub>IH</sub> V <sub>I</sub> = V <sub>CC</sub> , GND V <sub>O</sub> = V <sub>CC</sub> , GND			
I <sub>OLD</sub>	†Minimum Dynamic Output Current	5.5	—	—	75	mA	V <sub>OLD</sub> = 1.65 V Max			
I <sub>OHD</sub>		5.5	—	—	-75	mA	V <sub>OHD</sub> = 3.85 V Min			
I <sub>CC</sub>	Maximum Quiescent Supply Current	5.5	—	8.0	80	μA	V <sub>IN</sub> = V <sub>CC</sub> or GND			

\*All outputs loaded; thresholds on input associated with output under test.

†Maximum test duration 2.0 ms, one output loaded at a time.

NOTE: I<sub>IN</sub> and I<sub>CC</sub> @ 3.0 V are guaranteed to be less than or equal to the respective limit @ 5.5 V V<sub>CC</sub>.

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## AC CHARACTERISTICS (For Figures and Waveforms – See Section 3)

Symbol	Parameter	V <sub>CC</sub> * (V)	74AC			74AC		Unit	Fig. No.		
			T <sub>A</sub> = +25°C C <sub>L</sub> = 50 pF			T <sub>A</sub> = -40°C to +85°C C <sub>L</sub> = 50 pF					
			Min	Typ	Max	Min	Max				
t <sub>PLH</sub>	Propagation Delay Data to Output	3.3 5.0	2.0 1.5	6.5 5.0	9.0 7.0	1.5 1.0	10.0 7.5	ns	3-5		
t <sub>PHL</sub>	Propagation Delay Data to Output	3.3 5.0	2.0 1.5	6.5 5.0	9.0 7.0	2.0 1.0	10.0 7.5	ns	3-5		
t <sub>PZH</sub>	Output Enable Time	3.3 5.0	2.0 1.5	6.0 5.0	10.5 7.0	1.5 1.5	11.0 8.0	ns	3-7		
t <sub>PZL</sub>	Output Enable Time	3.3 5.0	2.5 1.5	7.5 5.5	10.0 8.0	2.0 1.5	11.0 8.5	ns	3-8		
t <sub>PHZ</sub>	Output Disable Time	3.3 5.0	3.0 2.5	7.0 6.5	10.0 9.0	1.5 1.0	10.5 9.5	ns	3-7		
t <sub>PLZ</sub>	Output Disable Time	3.3 5.0	2.5 2.0	7.5 6.5	10.5 9.0	2.5 2.0	11.5 9.5	ns	3-8		

\*Voltage Range 3.3 V is 3.3 V  $\pm$ 0.3 V.

\*Voltage Range 5.0 V is 5.0 V  $\pm$ 0.5 V.

## DC CHARACTERISTICS

Symbol	Parameter	V <sub>CC</sub> (V)	74ACT		74ACT		Unit	Conditions		
			T <sub>A</sub> = +25°C		T <sub>A</sub> = -40°C to +85°C					
			Typ	Guaranteed Limits	Typ	Guaranteed Limits				
V <sub>IH</sub>	Minimum High Level Input Voltage	4.5 5.5	1.5 1.5	2.0 2.0	2.0 2.0		V	V <sub>OUT</sub> = 0.1 V or V <sub>CC</sub> – 0.1 V		
V <sub>IL</sub>	Maximum Low Level Input Voltage	4.5 5.5	1.5 1.5	0.8 0.8	0.8 0.8		V	V <sub>OUT</sub> = 0.1 V or V <sub>CC</sub> – 0.1 V		
V <sub>OH</sub>	Minimum High Level Output Voltage	4.5 5.5	4.49 5.49	4.4 5.4	4.4 5.4		V	I <sub>OUT</sub> = -50 $\mu$ A		
		4.5 5.5	— —	3.86 4.86	3.76 4.76		V	*V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> —24 mA I <sub>OH</sub> —24 mA		
V <sub>OL</sub>	Maximum Low Level Output Voltage	4.5 5.5	0.001 0.001	0.1 0.1	0.1 0.1		V	I <sub>OUT</sub> = 50 $\mu$ A		
		4.5 5.5	— —	0.36 0.36	0.44 0.44		V	*V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> 24 mA I <sub>OL</sub> 24 mA		
I <sub>IN</sub>	Maximum Input Leakage Current	5.5	—	$\pm$ 0.1	$\pm$ 1.0		$\mu$ A	V <sub>I</sub> = V <sub>CC</sub> , GND		
$\Delta I_{CCT}$	Additional Max. I <sub>CC</sub> /Input	5.5	0.6	—	1.5		mA	V <sub>I</sub> = V <sub>CC</sub> – 2.1 V		
I <sub>OZ</sub>	Maximum 3-State Current	5.5	—	$\pm$ 0.5	$\pm$ 5.0		$\mu$ A	V <sub>I</sub> (OE) = V <sub>IL</sub> , V <sub>IH</sub> V <sub>I</sub> = V <sub>CC</sub> , GND V <sub>O</sub> = V <sub>CC</sub> , GND		
I <sub>OLD</sub>	†Minimum Dynamic Output Current	5.5	—	—	75		mA	V <sub>OLD</sub> = 1.65 V Max		
		5.5	—	—	-75		mA	V <sub>OHD</sub> = 3.85 V Min		
I <sub>CC</sub>	Maximum Quiescent Supply Current	5.5	—	8.0	80		$\mu$ A	V <sub>IN</sub> = V <sub>CC</sub> or GND		

\*All outputs loaded; thresholds on input associated with output under test.

†Maximum test duration 2.0 ms, one output loaded at a time.

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## AC CHARACTERISTICS (For Figures and Waveforms – See Section 3)

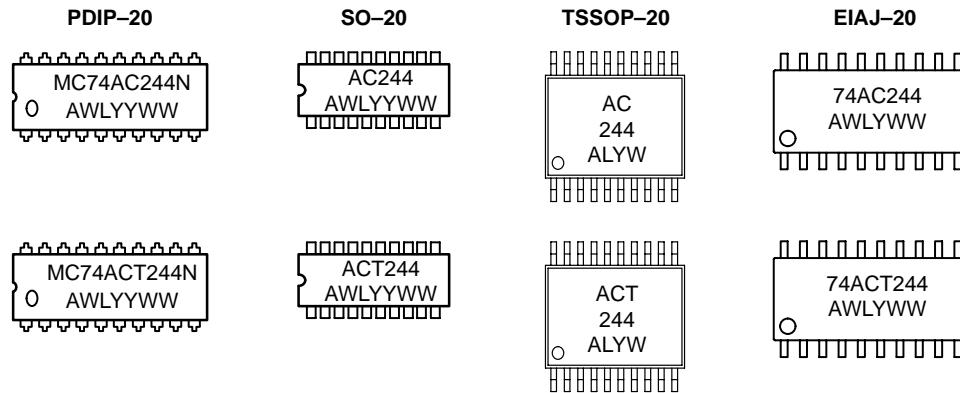
Symbol	Parameter	V <sub>CC</sub> * (V)	74ACT			74ACT		Unit	Fig. No.		
			T <sub>A</sub> = +25°C C <sub>L</sub> = 50 pF			T <sub>A</sub> = -40°C to +85°C C <sub>L</sub> = 50 pF					
			Min	Typ	Max	Min	Max				
t <sub>PLH</sub>	Propagation Delay Data to Output	5.0	2.0	6.5	9.0	1.5	10.0	ns	3-5		
t <sub>PHL</sub>	Propagation Delay Data to Output	5.0	2.0	7.0	9.0	1.5	10.0	ns	3-5		
t <sub>PZH</sub>	Output Enable Time	5.0	1.5	6.0	8.5	1.0	9.5	ns	3-7		
t <sub>PZL</sub>	Output Enable Time	5.0	2.0	7.0	9.5	1.5	10.5	ns	3-8		
t <sub>PHZ</sub>	Output Disable Time	5.0	2.0	7.0	9.5	1.5	10.5	ns	3-7		
t <sub>PLZ</sub>	Output Disable Time	5.0	2.5	7.5	10.0	2.0	10.5	ns	3-8		

\*Voltage Range 5.0 V is 5.0 V  $\pm$ 0.5 V.

## CAPACITANCE

Symbol	Parameter	Value Typ	Unit	Test Conditions
C <sub>IN</sub>	Input Capacitance	4.5	pF	V <sub>CC</sub> = 5.0 V
C <sub>PD</sub>	Power Dissipation Capacitance	45	pF	V <sub>CC</sub> = 5.0 V

## MARKING DIAGRAMS



A = Assembly Location

WL, L = Wafer Lot

YY, Y = Year

WW, W = Work Week